As the global steel industry undergoes a broad technological transformation, one of the biggest challenges is simply keeping up with the latest developments. From greenfield mill investments to unfolding decarbonization plans to new trade and climate policies, change is occurring rapidly, and it’s easy to lose sight of where the industry is heading.

That’s why AIST and partner World Steel Dynamics (WSD) this year launched a new conference meant to provide industry decision-makers with fresh perspectives and to help them navigate the decade ahead.

The conference, the Global Steel Dynamics Forum, took place 26–28 June 2023 in New York City. The inaugural conference accomplished what it set out to do,
delivering two-and-half days of rich insights and high-level ideas.

“The first Global Steel Dynamics Forum exceeded our expectations,” said Ron Ashburn, AIST executive director. The CEO community embraced this inaugural effort and we have a lot of momentum to expand our global reach for the event.” He added, “The concept was to provide the steel industry with a meaningful platform to articulate its vision for the future to the capital markets. With much of this effort intertwined with technology, our attendees learned firsthand about the key trends impacting steel in the years ahead.”

World Steel Dynamics chief executive officer Philipp Englin agreed, saying that the conference was a resounding success.

“The caliber of the speakers, the topics we explored during the program and the points of view that were shared all contributed to what was a highly successful event. We intend for
this conference to be an annual, must-attend event, and given the strength of our first program, we’ve established a solid foundation for future Global Steel Dynamics Forums. In fact, we’re already planning for next year.”

But before we consider the 2024 conference, let’s take a look at some of the highlights from this year’s event.

**Recent legislation will increase U.S. steel consumption.**

Nucor Corp., for one, already is seeing orders arising from the Infrastructure Reinvestment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act, according to chair and chief executive officer Leon Topalian.

“(This demand) is in our plants today. Orders are on the books,” Topalian said.

He said Nucor believes the legislation, which will provide for new energy infrastructure, manufacturing reshoring and a variety of public works, will annually drive 6 million to 8 million tons of new consumption over the next 10 years.

The CHIPS Act alone, he said, is giving rise to 34 new semiconductor plants representing US$374 billion in investment.

“It is massive,” he said, noting that the plants will all require reinforcing steel, beams, columns, conduit, doors and roof decking.

**So, too, will broader societal shifts throughout the world.**

According to POSCO Holdings chairman Jeong-Woo Choi, the
world will further urbanize and cities will evolve, incorporating new mobility infrastructure, renewable and decentralized energy networks, and net-zero buildings and modular construction. This all will generate new need for steel, as much as 315 million metric tons over the next seven years.

“As cities evolve, we can expect a rapid increase in the demand for steel,” he said, citing a World Steel Association (worldsteel) forecast.

Steelmakers, he said, will be tasked with producing CO$_2$-light and high-performing steels — steels that are durable, efficient, lightweight and corrosion-resistant.
And don’t forget the impact the U.S.-Mexico-Canada Agreement (USMCA), now three years old, has already had.

“I would say the USMCA has been a resounding success,” said Alan Kestenbaum, executive chairman of Stelco Inc.

He said Canada has drawn huge investment from foreign auto parts and vehicle battery manufacturers, who are setting up domestic shops to feed U.S. assembly plants, and vice versa.

“When I think of the auto industry in particular, the whole supply chain being able to be connected and not fearful of interruptions from trade is something that’s really beneficial,” he said. “And this is going to continue.”

The USMCA, however, isn’t flawless.

Lourenco Goncalves, chairman and chief executive officer of Cleveland-Cliffs Inc., said overseas producers are finding ways to sidestep USMCA rules, transshipping through...
Mexico. Mexico, he charged, is the current “transshipment capital of the world.”

“The USMCA is being exploited. That ‘M’ (in USMCA) is not a license for dumped things to come to the U.S. through Mexico.”

However, Ternium chief executive officer Máximo Vedoya, disagreed.

“That is not the case,” he said, explaining that while transshipments to the United States via Mexico are a problem, they are not an exceptionally large problem, and is one that is shared among the three USMCA countries.

“We know we have some problems, but the U.S. has the same, or bigger, problems,” said Vedoya. Still, Mexican authorities are working to address transshipments, he said, adding that a solution requires close cooperation among the USMCA governments and industry.

“The customer has to have choices, but that competition has to be fair and it has to be clean, and that’s one thing we should as an industry work together on,” he said.
We’ll need more steel, but how it’s made will vary.

ArcelorMittal executive vice president Brad Davey, head of corporate business optimization, said his company forecasts that global steel demand will grow to 2.5 billion metric tons by 2050, with scrap-based production accounting for about half of that market.

But, he said, steel will be made in different ways in different parts of the world. Blast furnaces (BFs) will continue to be used, although their carbon dioxide emissions will have been reduced to near-zero levels through a number of means, such as carbon capture use, he said.

Davey wasn’t the only one speaking for the viability of the BF-BOF route. Goncalves, for instance, said his company remains the supplier to the North American automotive market for the same reason that POSCO and JFE Steel are the automotive suppliers in their home countries.

“There’s a ceiling … that you cannot go beyond if you are in the business of melting scrap,” Goncalves said. Moreover, scrap-based producers may find themselves at a disadvantage in the future, he said.

“Scrap is not something you find on the ground, like iron ore,” he said. “The trend is showing that they’re not going to be in a comfortable position in terms of scrap price and availability.”
Topalian, however, disagreed with that assessment.

“There’s a lot of talk that, I think, is just rhetoric about a potential scrap scarcity. I think it’s a false narrative. I think it’s a narrative coming because of the competitive disadvantage that some of our integrated competitors have today from a sustainability standpoint — they can’t get to where we’re at (in terms of reducing CO₂ emissions).”

Customers do want green steel.

“It’s probably the fastest-moving part of our industry today,” said Topalian. “It’s becoming incredibly important.”

That’s especially so, he said, for automakers and the advanced manufacturing sector.

Case in point, he said, is Nucor’s branded Econiq net-zero steel. The company shipped its first coil of the product in early 2022. Now, Nucor expects to supply more than 1 million tons of Econiq over the next 12 months, Topalian said.

“The segment is growing. The demand is growing. I don’t see that changing in the near future.”

But whether customers are willing to pay a premium for it remains to be seen.

Timna Tanners, senior analyst and managing director for Wolfe
Research, said that so far, buyers don’t seem willing to spend the extra dollars.

“We talk to a lot of steel buyers, and I have yet to find any that are saying that their customers want to pay a green steel premium,” Tanners said.

“When you ask the mills who’s paying it, you get answers like ‘Apple,’ ‘the auto industry,’ selectively, but that’s not a big share of the market. So, unless anyone’s forced to, it’s going to be a tough ask. We see the same in aluminum,” she said.

“The appetite isn’t there.”

However, Theresa Wagler, Steel Dynamics Inc. chief financial officer, said it might be too soon to answer that question.

“First, you have to define green steel. We need a global standard. If we’re lowering the carbon inputs across the global economy, we need to be able to measure things apples to apples.”

But even then, the North American market might be unwilling to accept a premium for green steel, absent external costs for their carbon footprint.
And those, she said, certainly don’t exist today.

“Once there starts to be common measurability and when there is some sort of cost associated with that carbon footprint, then you (might begin to see an acceptance of green steel premiums).”

However, Janice Lee, managing director and partner with management consultancy Boston Consulting Group, said the firm is, in fact, beginning to see a willingness to accept a green steel premium.

“Based on our conversations across many geographies, we’re starting to see the green shoots of a green premium on steel between 10% and 30%. I do recognize that initial volumes are small and transactions are small, but we’re seeing an increasing willingness to really have that discussion,” she said.

“The companies that are capturing this green premium are those that are really talking to their customers and saying ‘what are you looking for in your decarbonization journey and how is steel part of that conversation.’”

Consensus on how to define green steel is, at present, out of reach.

As Steel Manufacturers Association president Philip K. Bell noted during one panel discussion, there are more than 50 standards, and counting, that promote steel industry decarbonization. Among them is the Global Steel Climate Council’s Steel Climate Standard, which his association helped draft.
Commercial Metals Company executive chairman of the board Barbara Smith and SSAB Americas president Chuck Schmitt agreed that a single standard remains elusive.

“I don’t see a near-term fix, quite frankly,” said Schmitt, adding that debate over such a standard is just as vigorous in Europe as it is in North America.

Whatever the industry and other stakeholders settle on, he said, transparency will be key.

“Otherwise, the confidence in what ultimately gets developed will not be there,” he said.

**Defining green steel will be difficult.**

In the U.S., two standards are coming to the fore, the ResponsibleSteel standard, which was founded by ArcelorMittal, and the Global Steel Climate Council standard, which was developed by Nucor Corp. and other electric arc furnace producers. ArcelorMittal’s Nicola Davidson and Nucor’s David Miracle debated the merits of these standards and their associated “flight paths” to decarbonization.

The differentiator in the standards appears to be the absolute versus relative reduction in carbon emissions, noting that raw materials and steel production process are unique around the world. Achieving a universally adopted approach will require much more effort and debate.

“Everyone is pretty much in broad agreement that green steel is near-zero steel. So the challenge is not in the long-term definition; the challenge is in the transition,” said Davidson.
Even if there’s a willingness to pay for green steel, the industry should consider whether it will have the people to make it.

Smith spoke to the industry’s ever-present recruitment challenges, saying that recruiting a talented and capable workforce must be a steel industry priority.

Fortunately, she said, the industry has a compelling case to make as a career choice.

“We have a great story to tell about our technology-driven operations. We offer young people who increasingly want to work for mission-driven companies and are hungry to change the world a unique opportunity unavailable to them elsewhere,” she said in accepting the Willy Korf/Ken Iverson Steel Vision Award, which was presented during the conference.

“If purpose-driven, environmentally concerned, tech-savvy young people are searching for a way to make a real, tangible and lasting difference, then we need to convince them to join our industry.”
Decarbonization has dominated industry headlines, but digitalization is a no-less important trend.

As an example, André Bier Gerdau Johannpeter, who serves as vice president of Gerdau’s board of directors, called attention to an effort at his company. He said seven to eight years ago, Gerdau undertook an initiative to incorporate digital tools throughout the business. And it has led to improvements throughout, he said, such as in its scrap yards. There, the company employs artificial intelligence, cameras, x-rays, and other equipment to determine the makeup of scrap in the incoming trucks and railcars.

“We don’t have people involved anymore,” he said. The result, he said, has been improvements in safety, efficiency and the avoidance of mistakes.

Battery electric vehicles are a tremendous opportunity for steel.

Automakers are redesigning cars and trucks from top to bottom, and each new design and each new component is an opportunity to showcase steel’s value proposition, said Goncalves.

As an example, he pointed to battery boxes, the enclosures that protect batteries in the event of a crash. Cleveland-Cliffs, he said, has been finding success in persuading automakers to adopt its Cliffs Steel Tubes As Reinforcement, or C-STAR.

“Opportunities are there. Demand is there,” he said.

A new challenge to auto steel is emerging.

As Davey said, steel has beaten back aluminum sheet in the automotive sector over the past several years, with steel remaining as the material of choice. However, automotive steel producers ought to be paying attention to “gigacasting,” large-scale, high-pressure aluminum die casting technology being pioneered by Tesla.
The technology allows for single-piece large components to be formed, which reduces assemble time and manufacturing costs, which is especially important for battery-electric vehicles makers.

“This new solution is different, and what’s different are the needs of a battery-electric vehicle manufacturer. These companies are investing massive amounts of capital — they’re really stretched and they need to reduce the capital intensity and the footprint of their manufacturing facilities. They’re looking at modular approaches to assemble much more efficiently, from an OpEx and CapEx point of view.”

The technology, to be sure, is a challenge for steel, he said, but steel does have an answer: multi-part solutions using press-hardened steel, which are available for the entire vehicle.

“These multi-part solutions are giving automakers the modularity they want,” Davey said, adding that battery-electric vehicle makers already are adopting the solution in door rings and the H-frame.

“This is the best steel solution to answer the aluminum high-pressure die casting.”
There are workarounds to a prime scrap shortage.

Steel Dynamics Inc. (SDI) chairman and chief executive officer Mark Millett said that, sure, prime scrap, as it is commonly thought of, will be tight in the years ahead.

“That tightness will drive the price up. There’s no doubt about that,” he said.

However, the prevailing definition of prime scrap might be too narrow, he said. As he explained, prime scrap is technically low-residual scrap, and low-residual scrap can, in fact, be end-of-life automobiles. While material from recycled vehicles might not be shiny and pristine on the surface, it was likely produced in a blast furnace 10 to 15 years ago.

“So if you take the material coming from an automotive shredder), … as long as you can effectively segregate the little pieces of copper and the little pieces of nickel and everything else, that obsolete flow can become prime scrap for your furnace.”

That strategy is paying off for SDI, he said, pointing out that the company’s Butler, Ind., USA, and Columbus, Miss., USA, sheet mills have lowered their prime scrap consumption from 60% to 65% down to 35% to 40% without any impact to steel quality.

“We’ve taken control of our destiny (in terms of scrap), and I think we’ll be very successful.”

We’ll meet again.

As a final thought, AIST and WSD wish to thank our sponsors for helping us make the inaugural Global Steel Dynamics Forum possible. The 2024 Global Steel Dynamics Forum will be held in June in New York. A venue and date will be announced soon.